

a delay plate to change the polarization of light incident thereon from said first element; and

a second element to change the optical path of light from said delay plate; and

a final polarization control optical switch comprising:

a second polarization controller that is capable of changing the polarization of light incident thereon by one of applying voltage thereto and not applying voltage thereto; and

a third element to change the optical path of light from said second polarization controller,

wherein said polarization control optical space switch has a plurality of inputs and the same number of outputs, and

*Control*  
*C!* wherein switching light from one input to one output requires controlling only one of said first, second and third elements.

24. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein said delay plate includes segments that do not delay light incident thereon.

25. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein said first element to change the optical path of light from said first polarization controller and the second element to change the optical path of light from said delay plate only change the optical path of p-polarized light.

*Sub 7*  
*D1* 26. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein said element to change the optical path of light from said polarization controller and the second element to change the optical path of light from said delay plate only change the optical path of s-polarized light.

27. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein said first element to change the optical path of light from said first polarization controller changes the optical path by moving light incident at the  $i$ -th input thereto to one of the  $(i-1)$ th and  $(i+1)$ th output.

28. (ONCE AMENDED) A polarization control optical space switch according to

claim 23, wherein said second element to change the optical path of light from said delay plate changes the optical path by moving light incident at an  $i$ -th input thereto to one of an  $(i-1)$ th and an  $(i+1)$ th output.

29. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein said first element to change the optical path of light from said first polarization controller is a downward polarizing beam splitter, which reflects incident light with a predetermined polarization input on the  $i$ -th input to the  $(i+1)$ th output.

30. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein said second element to change the optical path of light from said delay plate is an upward polarizing beam splitter, which reflects incident light with a predetermined polarization input on an  $i$ -th input to an  $(i-1)$ th output.

31. (ONCE AMENDED) A polarization control optical space switch according to claim 23, wherein the first element to change the optical path of light from said first polarization controller is constructed from a polarizing beam splitter array consisting of a combination of polarizing beam splitters.

32. (NEW) A polarization control optical space switch comprising:  
a plurality of polarization control optical switches connected together between a plurality of inputs and a corresponding plurality of outputs, each of said plurality of polarization control optical switches comprising:

a polarization controller changing the polarization of the light incident thereon by one of applying voltage thereto and not applying voltage thereto; and  
a switching element changing the optical path of the light from said polarization controller, wherein switching light from one of said plurality of inputs to one of said plurality of outputs requires controlling only one switching element provided in the respective one of said plurality of polarization control optical switches.

33. (NEW) A polarization control optical space switch comprising:  
polarization control optical switches, each having a plurality of inputs and a plurality of outputs and connected together as a matrix defined by columns and rows, each of the

polarization control optical switches comprising:

a polarization controller changing the polarization of light received by a respective input of the respective polarization control optical switch and incident on the polarization controller by one of applying voltage thereto and not applying voltage thereto, and

a switching element selectively outputting the polarization changed light to a respective output of the respective polarization control optical switch,

wherein switching light from a respective input of a respective polarization control optical switch in a first column of the matrix to a respective output of a respective polarization control optical switch in a last column of the matrix requires controlling only one switching element in the matrix.

34. (NEW) A polarization control optical space switch as in claim 33, wherein the matrix is an  $N \times N$  matrix.

35. (NEW) An apparatus comprising:

an optical space switch comprising:

polarization control optical switches, each having a plurality of inputs and a plurality of outputs and connected together as a matrix defined by columns and rows, each of the polarization control optical switches comprising:

a polarization controller changing the polarization of light received by a respective input of the respective polarization control optical switch and incident on the polarization controller by one of applying voltage thereto and not applying voltage thereto, and

a switching element selectively outputting the polarization changed light to a respective output of the respective polarization control optical switch,

wherein switching light from a respective input of a respective polarization control optical switch in a first column of the matrix to a respective output of a respective polarization control optical switch in a last column of the matrix requires controlling only one switching element in the matrix.

36. (NEW) A polarization control optical space switch comprising:

polarization control optical switches, each having a plurality of inputs and a plurality of outputs and connected together as a matrix defined by columns and rows, each of the polarization control optical switches comprising:

a polarization controlling means for changing the polarization of light received by a respective input of the respective polarization control optical switch and incident on the polarization controlling means by one of applying voltage thereto and not applying voltage thereto, and

a switching means for selectively outputting the polarization changed light to a respective output of the respective polarization control optical switch,

wherein switching light from a respective input of a respective polarization control optical switch in a first column of the matrix to a respective output of a respective polarization control optical switch in a last column of the matrix requires controlling only one of the switching means in the matrix.

37. (NEW) A polarization control optical space switch as in claim 36, wherein the matrix is an  $N \times N$  matrix.

38. (NEW) An apparatus comprising:  
an optical space switch comprising:

polarization control optical switches, each having a plurality of inputs and a plurality of outputs and connected together as a matrix defined by columns and rows, each of the polarization control optical switches comprising:

a polarization controlling means for changing the polarization of light received by a respective input of the respective polarization control optical switch and incident on the polarization controlling means by one of applying voltage thereto and not applying voltage thereto, and

a switching means for selectively outputting the polarization changed light to a respective output of the respective polarization control optical switch,

wherein switching light from a respective input of a respective polarization control optical switch in a first column of the matrix to a respective output of a respective polarization control optical switch in a last column of the matrix requires controlling only one of the switching means in the matrix.